

## TENT FRAME ASSEMBLY

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

The invention relates to a tent frame assembly, more particularly to a foldable tent frame assembly.

#### 2. Description of the Related Art

Referring to Figures 1 and 2, a conventional tent frame assembly for mounting a canopy thereon includes a plurality of post units 1, each of which includes two spaced-apart upright legs 11, two sleeve units 12 sleeved slidably and respectively on the upright legs 11, and two interconnected cross-link units 13 between the upright legs 11. Each of the cross-link units 13 includes a first link rod 131 and a second link rod 132 connected pivotally to and intersecting the first link rod 131. One end of the first link rod 131 is connected pivotally to a top end of a respective one of the upright legs 11, while one end of the second link rod 132 is pivotally connected to a respective one of the sleeve units 12. The other ends of the first and second link rods 131, 132 are connected pivotally and respectively to each other. The top ends of the upright legs 11 are provided with a plurality of upwardly extending and foldable rods (not shown) to serve as a top support for the canopy (not shown). Since the top support is not pertinent to the present invention, a detailed description of the same will be dispensed herewith for the sake of brevity.

When folding the conventional tent frame assembly, the upright legs 11 are moved toward each other, with the sleeve units 12 sliding simultaneously and downwardly along the lengths of the upright legs 11.

5 The sleeve units 12 pivot the second link rods 132 downwardly relative to the first link rods 131, thereby gradually gathering the various components of the tent frame assembly altogether. Since the first and second link rods 131, 132 are pivoted to and intersect each

10 other, the conventional tent frame assembly can be folded, but cannot be kept in a closely folded position because the link rods 131, 132 tend to stretch outwardly due to residual outward forces.

#### **SUMMARY OF THE INVENTION**

15 Therefore, the object of the present invention is to provide a foldable tent frame assembly that can be disposed in a fully folded state and that has enhanced supporting strength.

According to this invention, a tent frame assembly

20 for mounting a canopy thereon comprises a leg unit, a plurality of link units, and a plurality of first and second struts. The leg unit includes a plurality of spaced-apart upright posts respectively having first top connection elements, and a plurality of sleeve units

25 sleeved slidably and respectively on the upright posts below the first top connection elements. Each of the link units includes two upper and lower foldable links

disposed between an adjacent pair of the upright posts. The upper foldable link includes two first link sections respectively pivoted to the first top connection elements of the upright posts of the adjacent pair, and  
5 a first pivot unit connected between the first link sections. The lower foldable link includes two second link sections respectively pivoted to the sleeve units of the upright posts of the adjacent pair, and a second pivot unit connected between the second link sections.  
10 Each of the first struts has one end pivoted to a corresponding one of the sleeve units and the other end pivoted to one of the first link sections. Each of the second struts has one end pivoted to a corresponding one of the first top connection elements and the other  
15 end pivoted to one of the second link sections.

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

Other features and advantages of the present invention will become apparent in the following detailed description of the preferred embodiment with reference  
20 to the accompanying drawings, of which:

Figure 1 is a schematic view of a conventional foldable tent frame assembly;

Figure 2 is a view similar to Figure 1, but illustrating the tent frame assembly in a folded state;

25 Figure 3 is a perspective view of the preferred embodiment of a tent frame assembly according to the present invention;

Figure 4 is a schematic view to illustrate a leg unit and a link unit of the preferred embodiment;

Figure 5 is a fragmentary schematic view to illustrate a top support frame of the preferred embodiment;

5        Figure 6 is a fragmentary perspective view, illustrating a top end portion of an upright post of a leg unit of the preferred embodiment;

Figure 7 is a fragmentary perspective view, illustrating a sleeve unit of the preferred embodiment;

10       Figure 8 is a partly sectional, schematic top view of Figure 7;

Figure 9 is an enlarged fragmentary perspective view to illustrate a first pivot unit of the preferred embodiment;

15       Figure 10 is an enlarged fragmentary perspective view to illustrate a topmost connecting unit of the top support frame of the preferred embodiment;

Figure 11 illustrates a folding operation of the tent frame assembly of the preferred embodiment; and

20       Figure 12 is a schematic view to illustrate the preferred embodiment in a folded state.

#### **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

Referring to Figures 3 to 5, the preferred embodiment of a tent frame assembly 2 according to the present invention is used for mounting a canopy (not shown) thereon, and is shown to comprise a leg unit 3, a plurality of link units 4, a plurality of first struts 432, a

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plurality of second struts 431, and a top support frame 5.

The leg unit 3 includes a plurality of spaced-apart upright posts 31, and a plurality of sleeve units 32. 5 Each of the upright posts 31 has a top end portion 311 provided with two first top connection elements 313 and a second top connection element 313', which is spaced apart from each of the first top connection elements 313 by an angle of 45°, as shown in Figure 6, and a bottom 10 end portion 312 opposite to the first end portion 311. The sleeve units 32 are sleeved slidably and respectively on the upright posts 31 below the first top connection elements 313. Each of the sleeve units 32 has a main body 321 sleeved on an outer surface of the respective 15 upright post 31, and three second connecting pieces 322 which extend outwardly from the main body 321 and which form 45° angles thereamong, as shown in Figures 7 and 8. Each upright post 31 and the main body 321 of the corresponding sleeve unit 32 are provided respectively 20 with through holes 314, 324 (see Figure 8) to engage a protruding stub 331 (see Figure 8) of a C-shaped biasing member 33 (see Figure 8), which is disposed in the upright post 31 in a conventional manner, so as to position the sleeve units 32 on the upright posts 31.

25 Each of the link units 4 is disposed between an adjacent pair of the upright posts 31, and includes two upper and lower foldable links 41, 42 connected pivotally

and respectively to the upright posts 31. The upper foldable link 41 includes two first link sections 411 arranged in a straight line and pivoted to the respective first top connection elements 313, and a first pivot unit 412 connected between the first link sections 411. The lower foldable link 42 includes two second link sections 421 arranged in a straight line and pivoted to the respective sleeve units 32 through the respective connecting pieces 322, and a second pivot unit 422 connected between the second link sections 421. The first and second pivot units 412, 422 have similar configurations. As shown in Figure 9, the first pivot unit 412 has a U-shaped first channel 4121 that opens upwardly, and two spaced-apart pins 4122 which pass through the first channel 4121 to pivot respectively the first link sections 411. The second pivot unit 422 has a U-shaped second channel 4221 (see Figure 3) that opens downwardly, and two spaced-apart pins 4222 (see Figure 4) which pass through the second channel 4221 to pivot respectively the second link sections 421.

Each of the first struts 432 has one end pivoted to a corresponding one of the sleeve units 32 through the respective connecting piece 322, and the other end pivoted to one of the first link sections 411.

Each of the second struts 431 has one end pivoted to a corresponding one of the first top connection elements 313, and the other end pivoted to one of the

second link sections 421. The first and second struts 432, 431 cross each other, and cooperate to reinforce the link units 4.

5       The top support frame 5 is connected pivotally to  
the second top connection elements 313' of the upright  
posts 31, and is located on top of the link units 4 for  
supporting the canopy (not shown). The top support frame  
5, as shown in Figures 3, 4, 5 and 10, includes a topmost  
connecting unit 52, a plurality of first support rods  
10   511, a plurality of second support rods 513, and a  
plurality of third struts 512. The first support rods  
511 are pivoted respectively to the second top connection  
elements 313' of the upright posts 31. The second support  
rods 513 are pivoted respectively to the ends of the  
15   first support rods 511 that are distal from the upright  
posts 31, and extend toward each other. Each of the third  
struts 512 has one end pivoted to a corresponding one  
of the sleeve units 32, and the other end pivoted to  
a corresponding one of the first support rods 511. The  
20   topmost connecting unit 52 has a cross-shaped cross  
section, and includes four angularly spaced-apart pivot  
parts 521. The ends of the second support rods 513 that  
are distal from the first support rods 511 are pivoted  
respectively to the pivot parts 521.

25       When the tent frame assembly 2 of the present  
invention is unfolded, as shown in Figure 3, the canopy  
(not shown) can be mounted thereon.

Referring to Figures 5, 11 and 12, to fold the tent frame assembly 2, the upright posts 31 are simply moved toward the center so as to be disposed close to each other. The sleeve units 32, at the same time, slide  
5 downwardly along the lengths of the upright posts 31. The first pivot units 412 are moved downwardly and the second pivot units 422 are moved upwardly at this time so that the first and second link sections 411, 421 and the first and second struts 432, 431 can move closely  
10 relative to each other. At the same time, the topmost connecting unit 52 of the top support frame 5 is moved downwardly so that the first and second support rods 511, 513 move closely toward each other.

Since the upper and lower foldable links 41, 42 do  
15 not intersect each other, and since the first and second pivot units 412, 422 are used to interconnect pivotally the first and second link sections 411, 421, the first and second link sections 411, 421 are substantially parallel to each other when the tent frame assembly 2  
20 is folded. As such, the residual outward forces of the tent frame assembly 2 can be reduced when the assembly 2 is folded, thereby keeping stably the tent frame assembly 2 in the folded state.

While the present invention has been described in  
25 connection with what is considered the most practical and preferred embodiment, it is understood that this invention is not limited to the disclosed embodiment



but is intended to cover various arrangements included within the spirit and scope of the broadest interpretation so as to encompass all such modifications and equivalent arrangements.